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explained.——A new edition of Brehm's Thierleben, with 170 chromo-lithograph plates, is to be issued in 140 weekly parts, at 36 cents each, postpaid. B. Westermann & Co., of New York, are the agents in this country.——An annotated list of the birds of Nevada, by W. A. Hoffman, appears in the Bulletin of Hayden's U. S. Geological Survey, Vol. VI. It is prefaced by remarks on the distribution of vegetation in Nevada, as affecting that of the avi-fauna, and is accompanied by interesting profile views.——A valuable illustrated paper on the comparative anatomy and the histology of the brain, and more particularly of the *epiphysis cerebri* of Plagiostomes, Ganoids and Teleostei, by Dr. T. Th. Catter, gives us some apparently excellent drawings of the brains of *Raya clavata*, *Acanthias vulgata*, *Galeus canis*, *Acipenser sturio*, *Gadus morrhua*, *Cyclopterus lumpus*, and the common eel, which will be found very useful to naturalists in this country.——The *Zoölogischer Anzeiger*, for Nov. 14, contains a summary of new researches by Salensky, on the embryonal development of Salpa, and several articles on the intestinal worms.——Prof. Hæckel has gone to Ceylon on a scientific journey.——A new zoölogical station, to serve as a winter laboratory, and as an annex to the sea-side laboratory founded by Lacaze Duthiers at Roscoff, is to be opened at Banyuls-sur-Mer, on the Mediterranean. The building, says *Nature*, will be of considerable size, and the aquarium will be lighted by electricity.——An English adaptation of Claus' "Handbuch der Zoologie," by Mr. Adam Sedgwick, of Trinity College, Cambridge, with the addition of 500 to 600 drawings by Prof. Claus himself, is to be published by W. Swan, Sonnenschein & Co., London.——A hand-book of Vertebrate Dissection, by Prof. H. Newell Martin and William A. Moale, M.D., Part I, How to dissect a Chelonian, is announced as published by Macmillan & Co.

ENTOMOLOGY.[1]

On Some Curious Methods of Chalcid Pupation.—In the course of two years' study of the Chalcididæ, I have met with several anomalies connected with pupation, which seem to be worthy of description, and to which, so far as I can learn, with a single exception, the attention of entomologists has not been called.

One of the most curious of these instances, and one which has excited the greatest interest among my entomological friends to whom I have shown the specimens, is the case of a larva of *Phoxopteris divisana* Walk., an oak-feeding Tortricid, which has been parasited by an Euplectrus. The species I have called in MS. *E. albitrophis* and the method of pupation is so similar to that of *E. comstockii*, graphically described by Mr.

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[1] This department is edited by Prof. C. V. Riley, Washington, D. C., to whom communications, books for notice, etc., should be sent.

Schwarz in the January, 1881, number of the NATURALIST, as to need no extended description. The flat, empty skin of the host is united to the leaf by a mesh of coarse silk, in which are placed transversely the seven parasitic pupæ, each separated from the others by a silken partition, and protected as by a roof by the skin of the Phoxopteris. Other lepidopterous larvæ will undoubtedly be found to be infested by parasites of this interesting genus, and the only wonder is that no observations should have been recorded since the days of Fonscolombe.

In early July, while examining the mines of *Lithocolletis hamadryadella*, on the white oak at Washington, several mines were found, each of which presented a discolored portion, regularly elliptical in form, 3.5^{mm} long by 2^{mm} wide, the edge of which was marked by a series of small, regularly placed black dots. Upon removing carefully the separated epidermis of the leaf, the center of the discolored portion was seen to be occupied by a naked Chalcid pupa, not fastened to the leaf in any way, but held in place and protected by a series of minute cylindrical pillars, from twelve to fifteen in number, applied by flattened extremities to the upper and lower surfaces of the mine, and forming a regular ellipse around the pupa. The distances between the pillars were uniform, and the pillars themselves were very constant in size. Their length was about 0.35^{mm}. The excrement of Chalcid larvæ, as is well-known, is only voided at the change to pupæ, and is usually to be found in a few irregular pellets at the anal end of the body of the pupa. These pillars, however, seem to be clearly excrementitious, and yet must have been formed by the Chalcid larva prior to pupation; but, as the anal end of the alimentary canal is only open during the transition to pupa, the material composing the pillars must have been expelled from the mouth of the larva, and shaped while yet moist. The most natural thought which suggests itself as to the object of this peculiar disposition of the excrement, is that the pillars by separating the floor and the roof of the mine save the pupa from the pressure of the latter, as the mine of *L. hamadryadella* is flat and not tentiform. If this be so, and no other reasonable explanation offers itself, it is certainly a most interesting and unlooked-for provision. The adult proved to belong to a brilliant little species of *Chrysocharis* Först, which I have called in MS. *C. singularis*.

While engaged one day in October in an oak wood, gathering galls with a view of breeding parasites, I found upon the under side of a leaf a curious assemblage of small black bodies, resembling, as much as anything I could think of, the excrement of some caterpillar. They were shapeless little objects, each mounted on end, and at the extremity of each, next the leaf, was a small racemose cluster of minute light gray globules. Without giving them a careful examination I settled it in my mind that the globules were the sporidia of some fungus which had settled upon the excremental pellets as a matrix. With this view I stowed the leaf away in a pill-box, purposing to carry it to a mycological friend next day. On the following morning, however, I was greatly surprised to find that from several of my supposed excremental pellets had issued active little Chalcid flies. This of course led to a closer examination, and to the discovery that the supposed pellets were the bunchiest, most shapeless, most coarctate Chalcid pupæ I had ever seen. There were twenty-two of them in all, arranged around an irregular oval a centimeter long, the center of which had evidently, from the scattered hairs, once been occupied by the caterpillar upon which they had fed. Each pupa was fastened by its anal end to the leaf, and the clusters of light gray globules at the end of each, which I had taken for sporidia were nothing more than the contents of the alimentary canal, ejected before pupation. The surface of the leaf in the center of the oval space, round which the pupæ were clustered, was covered with a thin web of silk, which rendered the attachment of the pupæ to the leaf easier and firmer.

From these strange objects the adult Chalcids emerge by bursting off the upper portion of the pupa skin, leaving the separated part attached only by the sheaths of the posterior legs. The line of fracture extends behind the head and down caudo-ventrally, including the wing and leg sheaths in the separated portion. It has been suggested to me that the apparent want of form which these pupæ show—their extreme coarctation—could be explained on the supposition that the very delicate larval skin was not shed at all, but simply contracted closely around the pupa and its members as it formed. After softening the pupa, however, in various menstrua, the most careful examination showed no trace of such a skin. The strange form must rather be laid to some peculiarity in the secretion of the chitine.

Since this first experience I have several times found these interesting and sociable-looking little groups of pupæ upon oak leaves. The little mass of excremental globules at the end of each, by its decided contrast of color, adds much to the strangeness of the appearance. I have never found other trace of the host than the scattered hairs, which show it to be a bombycid larva. The Chalcid issuing normally from these pupæ is a species of the true genus *Eulophus;* but one is apt to be misled by the frequent presence of a secondary parasite—an *Astichus.* The latter, however, instead of issuing in the manner indicated above, makes its exit through a circular hole, cut usually in the thorax of the pupa. It is, moreover, a much smaller insect than the Eulophus.—*(To be continued.)*—*L. O. Howard.*

ON THE OVIPOSITION OF PRODOXUS DECIPIENS.[1]—In his paper treating of this insect, read at the Boston meeting, the author stated that oviposition had not been observed. He has studied it carefully the past summer, and finds that, as the structure of the ovipositor would indicate, the female stations herself lengthwise with the axis of the stem, usually head upward, and literally saws through the epidermis with an up and down motion, just such as a carpenter would make in endeavoring to work the tip of an ordinary hand saw into the trunk of a tree. She never has anything to do with the stigma of the flower, as Pronuba does, and the important and interesting fact is recorded that the eggs of Prodoxus are all inserted while the stem is soft and before the flowers begin to open, *i. e.*, before Pronuba usually appears. As soon as the flowers begin to open (in *Yucca filamentosa*, the species upon which the observations were made) the stem has become too hard to permit the female to do her work, and the species has, for the most part, disappeared, only a few belated individuals being subsequently found, and these, so far as could be observed, perishing without issue. In experiments made to test the matter, it was found that where a female succeeded in inserting the ovipositor into a stem that had become hard, she perished in the effort to disengage herself, and remained firmly attached to the stem.

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[1] Abstract of a paper read by C. V. Riley at the Cincinnati meeting of the A. A. A. S.

CLOVER INSECTS.—We have received an interesting brochure on the insects of the clover plant by Mr. Lintner, the State Entomologist of New York. After an introduction showing by quotations from Mr. George Geddes, the importance of the clover crop, especially to the people of New York State, he makes manifest the large increase of insect depredators on the plant. He then remarks upon the fact that no notice of clover insects appears in the reports of Dr. Fitch, his predecessor; which fact indicates the scarcity or the unimportance of the insects affecting the crop in Fitch's time. He next quotes from Kaltenbach's Pflanzenfeinde a list of sixty-six species affecting clover in Europe, and by way of comparison gives a list of our own species which includes thirty-three Lepidoptera, three Coleoptera, three Diptera, five Orthoptera and two Homoptera, and concludes with a detailed account of *Hylastes trifolii*, *Cecidomyia leguminicola*, *C. trifolii* and *Oscinis trifolii.*

It may be safely assumed that the number of species in this country affecting the plant, though not perhaps injuriously, will be at least doubled by future observation, and in Coleoptera we feel confident that it will be quintupled.

HORN'S CLASSIFICATION OF THE CARABIDÆ.—A great deal of the classificatory work done by entomologists is based upon the study of isolated groups or of more or less restricted local faunas. Useful as such work may be, yet the complex relationships of forms; the true value of characters used for separating genera and higher groups; the coördination or subordination of characters, and other important classificatory questions, can be fully recognized only by study of a whole family from all parts of the globe. Dr. Geo. H. Horn, whose excellent work on the Silphidæ was noticed not long since in these columns (p. 128), has just published in the Transactions of the American Entomological Society (vol. IX, pp. 91–196, plates III–X), an elaborate paper "On the genera of Carabidæ with special reference to the fauna of Boreal America." This is the first paper covering the general classification of this large family which has appeared since the publication of Lacordaire's first volume of his "Genera des Coléoptères" though a number of important papers by LeConte, Schaum and Chaudoir have contributed to our knowledge of the subject. Dr. Horn begins with a discussion of the characters of the Adephagous series of Coleoptera and divides them into seven families, the formation of the metasternum being of primary importance. The Haliplidæ, Amphizoidæ and Pelobiidæ are considered as families equivalent to the long established ones, viz: Cicindelidæ, Carabidæ, Dytiscidæ and Gyrinidæ. The Pseudomorphidæ, formerly looked upon as a distinct family, are made to constitute one of the three sub-families (Pseudomorphinæ) of Carabidæ, the two others being the Carabinæ and Harpalinæ, the bulk of the tribes and genera being embraced in the Harpalinæ. Tables and full expositions of the characters of the tribes of the whole family are then given, accompanied by tables of the genera occurring in our fauna. We cannot, in our limited space, treat of this important paper in detail; but if the student will compare the lucid and ingenious arrangement of the sub-family Harpalinæ, for instance, as given by Dr. Horn, with the former chaotic arrangements, he will be able to form an idea, not only of the immense amount of labor expended, but also of the excellency of the work. It is, perhaps, the most important of the several revisions the author has of late years given us—all of them so fresh, thorough and original, that it is a veritable pleasure to work by them.—*C. V. R.*

THE BUTTERFLY TREES OF MONTEREY AGAIN.—We gave in the July number of this magazine an abstract from a letter of Miss Jennie R. Bush, of San José, Cal., in reference to the so-called butterfly trees, near Monterey, of that State. From specimens sent some time ago by Miss Bush, we find that the butterfly in question is the cosmopolitan *Danais archippus*, which, as is well known, has a similar habit of congregating in immense numbers on trees in the Atlantic States, and does this during winter in the extreme Southeast (vide *American Entomologist*, Vol. III, p. 102). It was on the 27th of February that Miss Bush observed the phenomenon above related. The inference to be drawn from the interesting facts is, that the species finds on the Pacific slope, about the latitude 36° 30′, a climate congenial to its hibernation, whereas on the Atlantic side, it has to migrate southward so far as latitude 30°.

INTEREST FELT IN ECONOMIC ENTOMOLOGY IN CALIFORNIA.—The Board of State Horticultural Commissioners issued a call for a State Convention of fruit-growers, shippers, packers, nurserymen, and others interested in horticulture in California, to be held at the Senate Chamber, Sacramento, on Tuesday and Wednesday, the 6th and 7th of December, 1881, to commence at 10 o'clock, A. M. of the 6th, for the purpose of consultation and discussion of the most practical means of exterminating the insect pests, now infesting the orchards and gardens of that State; and such other subjects as may be introduced for the improvement of the fruit-growing industries of California. The Central Pacific Railroad Co. kindly allowed a two-thirds rate of fare from all their stations in California, to persons attending the convention, and issued instructions to their agents at all points in California, to sell tickets at a two-thirds rate of fare.

OBITUARY.—We regret exceedingly to have to record the death of Joseph Duncan Putnam, president of the Davenport Academy of Natural Science. He died on the 10th of December, at his home in Davenport, in the 27th year of his age, having been born in Jacksonville, Ills., Oct. 18, 1855. From boyhood, Mr. Putnam found fascination in the study of nature, and as he grew older, gave more and more attention to entomology. In 1872 and 1873 he traveled and collected in Colorado and Wyoming, in company with Dr. C. C. Parry. By the people of Davenport he will be most remembered for his unflagging efforts in behalf of the Academy of Sciences, which is so largely indebted to him. In entomology, his chief work was on the Coccids, and at the time of his death he was still deeply interested in the family, and in the Solpugidæ. Soon after his return from the West, in 1872, he contracted a severe cold, from the effects of which he never fully recovered. We first became acquainted with the deceased about that time, when he was greatly emaciated and racked by a very severe cough. Of late years he seemed to grow stronger, and get more free of his lung trouble, so that there was hope of prolonged life and usefulness for one who made friends of all whom he met, by a quiet modesty and lovable disposition, combined with diligent study, earnestness and enthusiasm, all the more remarkable, because of the physical suffering he struggled with. His bereaved family have our heartfelt condolence.

The announcement of the death of Count Georges Vandalia Mneszech, on Nov. 17th, at Paris, aged 58, has also just reached us through the editor of *Psyche*. He had one of the most extensive collections of Coleoptera in the world.